

## SEQUENCE LISTING

## PAECEIVED DEC 2 8 2001 TECH CENTER 1600/2900

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THEIR USES
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Ser Trp 50	Ser Al	a Pro	Glu	Arg 55	Ala	Ser	Pro	Ala	Pro 60	Gly	Gly	Arg	Leu	
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Ile Arg	Pro Se	r Val 85	Tyr	Arg	Asn	Val	Ala 90	Arg	Gln	Leu	His	Ile 95	Pro	
Leu Gln	10	0				105					110			
His Ile	Phe Se 115	r Ala	Gly	Ile	Thr 120	Trp	Gly	Lys	Val	Val 125	Ser	Leu	Tyr	
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Ala Met ' 145			150					155					160	
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Lys Cys	18	)				185					190			
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_										tgc Cys 95		288
										ctg Leu		336
										ggt Gly		384
										ttc Phe		432
										ctg Leu		480
_	_		ctg Leu	_			_	tga *				513
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gca ga Ala Gl 65													240
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ctg ca Leu Gl													336
cac at		Ser											384
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gcc ate Ala Me 145													480

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Ile Arg Pro			g Asn	Val			Gln	Leu	His				
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His Ile Phe	100 Ser Ala	Glv Ile	• Thr	105 Trp	Glv	Lvs	Val	Val	110 Ser	Leu	Tvr		
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Thr Leu Ala	_		g Arg	Arg			Trp	Thr	Asp				
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At a gag gtg ctg cgg cgc tct tcg gtc ttc gct gcg gag atc atg gac Met Glu Val Leu Arg Arg Ser Ser Val Phe Ala Ala Glu Ile Met Asp 10 15 15 15 15 15 16 16 10 16 16 10 16 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 10 16 16 16 16 16 16 16 16 16 16 16 16 16																		
atg gag gtg ctg cgg cgc tct tcg gtc ttc gct gcg gag atc atg gac Met Glu Val Leu Arg Arg Ser Ser Val Phe Ala Ala Glu Ile Met Asp 1 1 5 10 15  gcc ttt gat cgc tgg ccc aca gac aag gag ctg gtg gcc cag gct aaa Ala Phe Asp Arg Trp Pro Thr Asp Lys Glu Leu Val Ala Glu Ala Lys 20 25 30  gca cta ggc cgg gag tac gtg cac gcg cgg ctt ttg cgc gcc ggc ctc Ala Leu Gly Arg Glu Try Val His Ala Arg Leu Leu Arg Ala Gly Leu Asp Cys Ctc tgg agc ctc ggg gcc ctc ggc cct ggc ctc ggg gcc ctc ggg agc gcc ctc ggc gcc ctc gga ggc ctc ttg gga gac ctg ggg ctg for Trp Ser Ala Pro Glu Arg Ala Ser Pro Ala Pro Gly Gly Arg Leu 50 60  gca gag gtg tgc acc gtg ctg ctg cgc ttg gga atc aca tgg ggc aag Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 65 70 75 80  gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gac tag gtg tcl Val Val Ser Leu Try Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85 90 95  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ctg ggg cta gcg gac tgc gtc Val Val Ser Leu Try Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85 90 95  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ctg ggg acc acc gcg ctg gac ctg gcg ctg gac tcg gtg ctg ctg ctg ctg ctg ctg ctg ct	<22	:2>	(1	.)	. (51	3)												
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Ala Phe Asp Arg Trp Pro Thr Asp Lys Glu Leu Val Ala Gln Ala Lys 20  gca cta ggc cgg gag tac gtg cac ggc cgg ctt ttg cgc gcc ggc ctc Ala Leu Gly Arg Glu Tyr Val His Ala Arg Leu Leu Arg Ala Gly Leu 35  tcc tgg agc gct cca gag cgt gcc tcg cct gcc cct gga gga cgc ctg Frp Ser Ala Pro Glu Arg Ala Ser Pro Ala Pro Gly Gly Arg Leu 50  gca gag gtg tgc acc gtg ctg ctg cgc ttg gga atc aca tgg ggc aag Ala Gly Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 65  70  gta gtg tcc ctg tac tcg gcg gct ggg gga cta ggc ggg gga cta ggg gga atc aca tgg ggc aag Ala Gly Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 65  75  gta gtg tcc ctg tac tcg gcg gcg gga cta ggg gga cta ggg gga cta ggg gga cta ggg gga Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc gtg Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 110  gaa ttt gta cgc aag acc ttg gct acc tgg ctg gtc acc tgg ctt cgg agg gga gg gga Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aca ctc tgc agc ttt ggc cgc ttc cgc 432  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aca ctc tgc agc ttt ggc cgc ttc ctg Ser Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 133  acc cac tgg ctc ctc ctg ttg cca gag aga tga Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Pro Glu Arg  **																		
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Ala Leu Gly Arg Glu Tyr Val His Ala Arg Leu Leu Arg Ala Gly Leu  192  192  192  192  193  194  195  195  196  197  198  198  199  199  199  199  199														~~				
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Ser Trp Ser Ala Pro Glu Arg Ala Ser Pro Ala Pro Gly Gly Arg Leu  gca gag gtg tgc acc gtg ctg ctg cgc ttg gga atc aca tgg ggc aag Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 65 70 80  gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gac tgc gtc Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85 90  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc gtg Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt gga gga 336  Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtc acc tgg ctt cgg acc aca ctc tgg ctc gga caca cct ggc ttc cgc Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Leu Lys Cys Val Val Ser Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 145  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg **									- 0									
gca gag gtg tgc acc gtg ctg ctg cgc ttg gga atc aca tgg ggc aag 240 Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 80  gta gtg tcc ctg tac tcg gcg gct ggg gga cta gcg gtg gac tgc gtc Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Peu Ala Val Asp Cys Val 90  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc gtg ggg Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 110  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggg ggg 336 Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtc agc aca acc tc tgg ctc agc aca acc tc gg ctc cac tcg gcg ttc cgc 432  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *		_		_	_			_	_	_								192
gca gag gtg tgc acc gtg ctg ctg cgc ttg gga atc aca tgg ggc aag 240 Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 80  gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gac tgc ggt gac tgc Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 95  ccg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ggg 336 Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 110  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg gtg gag ctg ggg ggg 336 Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115  tcg acg gac gtc ctc aag tgt gtg gtc acc tgg ctt cgc gg ggg 384  tcg acg gac gtc ctc aag tgt gtg gtc acc tgg ctt cgc ggc 432  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 135  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 155  gct gca ttc ttc ctc ctg ttg cca gag aga tga **  Sala Ala Ala Phe Phe Leu Leu Leu Leu Pro Glu Arg **	Ser		-	Ser	Ala	Pro	Glu	_	Ala	Ser	Pro	Ala		GLy	GIY	Arg	Leu	
Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys 65 70 80  gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gac tgc gtc Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85 90 95 336  Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100 105 110  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gac Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115 130 135 140  tcc cac tgg ctc gtg gcc aca acc tc tgc agc ttt ggc cgc ttc cgc 432  Thr Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130 135 150 150  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Pro Glu Arg *		-	50					33					80					
gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gac tgc gtc 288 Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85																		240
gta gtg tcc ctg tac tcg gcg gct gcg gga cta gcg gtg gtg gac tgc gtc 288  Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc gtg ggg 336  Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384  Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aca aca cct ggc ctg ggt gga 384  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *			lu	Val	Cys	Thr		Leu	Leu	Arg	Leu	_	Ile	Thr	Trp	Gly	_	
Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val 85  cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ctg ggg Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384  Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtg gtc agc aca aaa cct ggc ttc cgc Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Pro Glu Arg *  *  *  *  *  *  *  *  *  *  *  *  *	65						70					/5					80	
cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ctg ggg 336 Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384 Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Gly Gly 115  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aca cct ggc ttc cgc 432 Trp Thr Asp Val Leu Lys Cys 135  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc gcc ttc ctg aag 480 Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 155  gct gca ttc ttc ctc ctg ttg cca gag aga aga aga aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *																		288
cgg caa gct cag cca gcc atg gtt cat gcc ctg gtt gac tgc ctg ggg 336 Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 1100  gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384 Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Gly Gly 125  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aca ctc gg ttc cgc ggt ttc cgc 432 Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480 Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 155  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *	Val	Va	al	Ser	Leu		Ser	Ala	Ala	Ala		Leu	Ala	Val	Asp		Val	
Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly 100 105 110 110 110 110 110 110 110 110						85					90					95		
gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384 Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Gly Gly 115																		336
gaa ttt gta cgc aag acc ttg gct acc tgg ctt cgg agg cgt ggt gga 384  Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Gly Gly 115 120 125  tgg acg gac gtc ctc aag tgt gtg gtc agc aca aaa cct ggc ttc cgc 432  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130 135 140  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *	Arg	Gl	ln	Ala		Pro	Ala	Met	Val		Ala	Leu	Val	Asp	-	Leu	Gly	
Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Arg Gly Gly 115					TOO					102					110			
tgg acg gac gtc ctc aag tgt gtg gtc agc aca aaa cct ggc ttc cgc 432  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *																		384
tgg acg gac gtc ctc aag tgt gtg gtc agc aca aaa cct ggc ttc cgc 432  Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130 135 140  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Pro Glu Arg *	Glu	Ph			Arg	Lys	Thr	Leu		Thr	Trp	Leu	Arg		Arg	Gly	Gly	
Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg 130 135 140  tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 145 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *				115					120					125				
tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Leu Pro Glu Arg *			_	_	_		_	_		_	_						_	432
tcc cac tgg ctc gtg gcc aca ctc tgc agc ttt ggc cgc ttc ctg aag 480  Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 145 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga Ala Ala Phe Phe Leu Leu Pro Glu Arg *	Trp			Asp	Val	Leu	Lys		Val	Val	Ser	Thr		Pro	Gly	Phe	Arg	
Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys 145 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga 513 Ala Ala Phe Phe Leu Leu Pro Glu Arg *		13	5 U					135					140					
145 150 155 160  gct gca ttc ttc ctc ctg ttg cca gag aga tga 513  Ala Ala Phe Phe Leu Leu Pro Glu Arg *																		480
gct gca ttc ttc ctc ctg ttg cca gag aga tga 513 Ala Ala Phe Phe Leu Leu Pro Glu Arg *	Ser		İs	Trp	Leu	Val		Thr	Leu	Cys	Ser		Gly	Arg	Phe	Leu	_	
Ala Ala Phe Phe Leu Leu Pro Glu Arg *	4 4						T20					122					100	
	145																	
			ca	ttc	ttc	ctc	ctg	ttg	cca	gag	aga	tga						513

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Ala Leu Gly Arg Glu Tyr Val His Ala Arg Leu Leu Arg Ala Gly Leu
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Ser Trp Ser Ala Pro Glu Arg Ala Ser Pro Ala Pro Gly Gly Arg Leu
                        55
Ala Glu Val Cys Thr Val Leu Leu Arg Leu Gly Ile Thr Trp Gly Lys
Val Val Ser Leu Tyr Ser Ala Ala Ala Gly Leu Ala Val Asp Cys Val
              ··· 85
                                    90
Arg Gln Ala Gln Pro Ala Met Val His Ala Leu Val Asp Cys Leu Gly
                               105
Glu Phe Val Arg Lys Thr Leu Ala Thr Trp Leu Arg Arg Gly Gly
                           120
Trp Thr Asp Val Leu Lys Cys Val Val Ser Thr Lys Pro Gly Phe Arg
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Ser His Trp Leu Val Ala Thr Leu Cys Ser Phe Gly Arg Phe Leu Lys
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Ala Ala Phe Phe Leu Leu Pro Glu Arg
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Gly Asp Glu
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8

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